

$\beta^1$  Sub c17 a crystallographically oriented first polycrystalline silicon layer, which has been formed by introducing a metal catalyst element (i) into, or (ii) so as to come into contact with a surface portion of, an amorphous silicon layer, the amorphous silicon layer being formed on the surface of the conductive substrate or the conductive layer, and heat treating the amorphous silicon layer to crystallize the amorphous silicon layer; and

a second polycrystalline silicon layer which has been formed without catalytic effect, using the first polycrystalline silicon layer as a seed crystal, so as to have the same conductivity type as the first polycrystalline silicon layer.

---

11. (Amended) A crystalline silicon thin film photovoltaic device comprising:

a conductive substrate or an insulating substrate having on its surface a conductive layer;

$\beta^2$  a first polycrystalline silicon layer of a first conductivity type which has been formed by introducing a metal catalyst element (i) into, or (ii) so as to come into contact with a surface portion of, an amorphous silicon layer, the amorphous silicon layer being formed on the surface of the conductive substrate or the conductive layer, and heat treating the amorphous silicon layer to crystallize the amorphous silicon layer;

a second polycrystalline silicon layer which has been formed without catalytic effect, using the first polycrystalline silicon layer as a seed crystal, so as to have the same conductivity type as the first conductivity type;

a substantially i-type third polycrystalline silicon layer formed, without catalytic effect, [provided] on the second polycrystalline silicon layer;

*B<sub>2</sub> SUB C.7*  
a fourth polycrystalline silicon layer that is formed, without catalytic effect, on the third polycrystalline silicon layer and is of a second conductivity type which is different from the first conductivity type; and  
an electrode part provided on the fourth polycrystalline silicon layer.

---

*B<sub>3</sub>*  
13. (Amended) A crystalline silicon thin film photovoltaic device comprising:  
an insulating substrate having on its surface an electrode;  
a first polycrystalline silicon layer of a first conductivity type which has been formed by introducing a metal catalyst element (i) into, or (ii) so as to come into contact with a surface portion of, an amorphous silicon layer, the amorphous silicon layer being formed on the electrode of the insulating substrate, and heat treating the amorphous silicon layer to crystallize the amorphous silicon layer;  
a second polycrystalline silicon layer which has been formed without catalytic effect, using the first polycrystalline silicon layer as a seed crystal, so as to have the same conductivity type as the first conductivity type;  
a third polycrystalline silicon layer which is formed without catalytic effect on the second polycrystalline silicon layer and is of a second conductivity type which is different from the first conductivity type; and  
an electrode part provided on the third polycrystalline silicon layer.

---

Please add the following new claims 17-20:

*B<sub>4</sub>*  
17. (NEW) A crystalline silicon thin film semiconductor device, comprising:

SUB  
C1 7  
a conductive substrate or a substrate having on its surface a conductive layer;  
a first polycrystalline silicon layer having a connectivity type, formed of (i) an amorphous silicon layer disposed on the surface of the conductive substrate or the conductive layer, and (ii) a metal catalyst element introduced into, or into contact with a surface portion of, the amorphous silicon layer, with the amorphous silicon layer crystallize by heat treatment; and

B4  
a second polycrystalline silicon layer, having the same conductivity type as the first polycrystalline silicon layer, and being formed using the first polycrystalline silicon layer as a seed crystal.

18. (NEW) The crystalline silicon thin film semiconductor device according to claim 17, wherein:

the second polycrystalline silicon layer is formed by plasma CVD.

19. (NEW) The crystalline silicon thin film semiconductor device according to claim 17, wherein:

the second polycrystalline silicon layer is formed at a temperature of approximately 300° C or less.

20. (NEW) The crystalline silicon thin film semiconductor device according to claim 17, wherein:

Our Ref.: 3008-0034  
File No.: 521.41463X00  
Client Ref.: PHCF-01103

PATENT

124 the second polycrystalline silicon layer is formed without the metal catalyst element in the first polycrystalline silicon layer acting as a catalyst in the formation of the second polycrystalline silicon layer.

---